Improving Navy Intelligence Job Aptitude Standards and Classification Outcomes

Navy Workforce Research and Analysis Conference

March 31/April 1

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Objectives of Cryptologic Technician Intelligence Study

- **Replace current CTI ASVAB composite that contained two ASVAB tests removed from the battery January 2002**

- **Assess how much the Defense Language Aptitude Battery is predicting school performance over and above ASVAB**

- **Recommend CTI aptitude standards that are more valid and will decrease attrition and setback rates without lowering recruit qualification rate**

Usual Criteria for Validation Study

- **New or merged ratings**
- **Multiple cutscores**
- **High attrition or setback rates**
- **Critical ratings that are hard to fill**
- **Ratings with suspected low ASVAB validity**
    - **can lower cutscore with little impact on graduation**
- **High aptitude requirements of advanced training pipeline**
- **Major curriculum revision**
- **Formation of occupation groups**

Validation Study Steps

- **Request from N-132 (for CNP) via ECMs**

- **Attend Training Task Analysis meeting if rating merger**

- **School visit**

    - **Obtain curriculum outline and testing plan**

    - **Observe laboratories and collect data**

    - **Meet with school officials**

- **Conduct validation study and submit letter report to ECM and school officials for input and feedback**

- **Submit final letter report to N-132 for approval**

- **N-132 approves and distributes NAVADMIN and CNRC letter directing ASVAB changes in Navy systems**

ASVAB Tests

GS	General Science
AR	Arithmetic Reasoning
WK	Word Knowledge
PC	Paragraph Comprehension
AS	Auto & Shop Information
MK	Mathematics Knowledge
MC	Mechanical Comprehension
EI	Electronics Information
VE	Verbal (WK + PC)
AO	Assembling Objects (Navy use in FY03)
NO	Numerical Operations (Eliminated in FY02)
CS	Coding Speed (Eliminated in FY02)

1) **Defense Language Aptitude Battery**

2) **Navy Advanced Placement Test**

3) **Coding Speed**

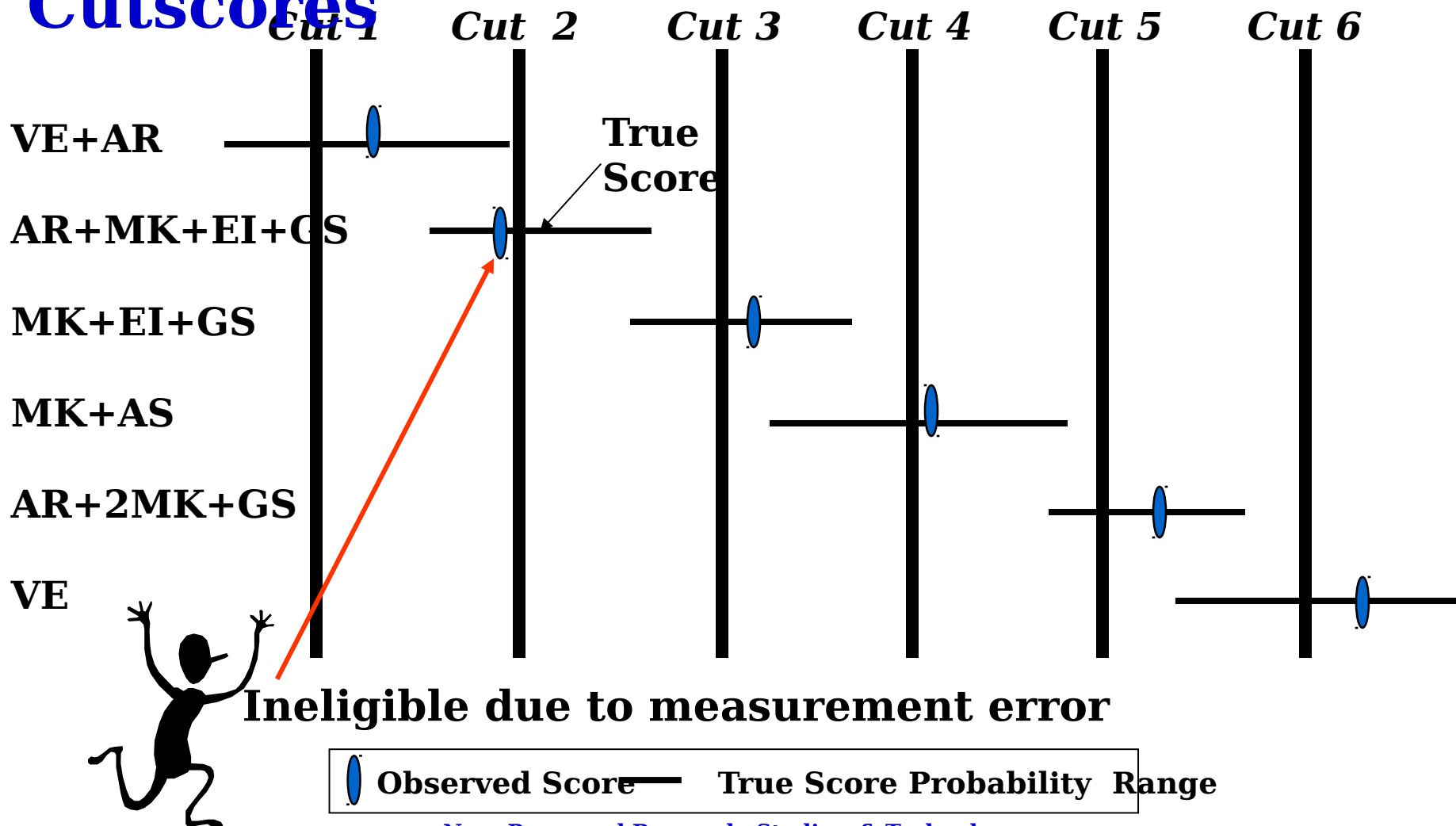# Initial Cryptologic Technician Intelligence Aptitude Standards
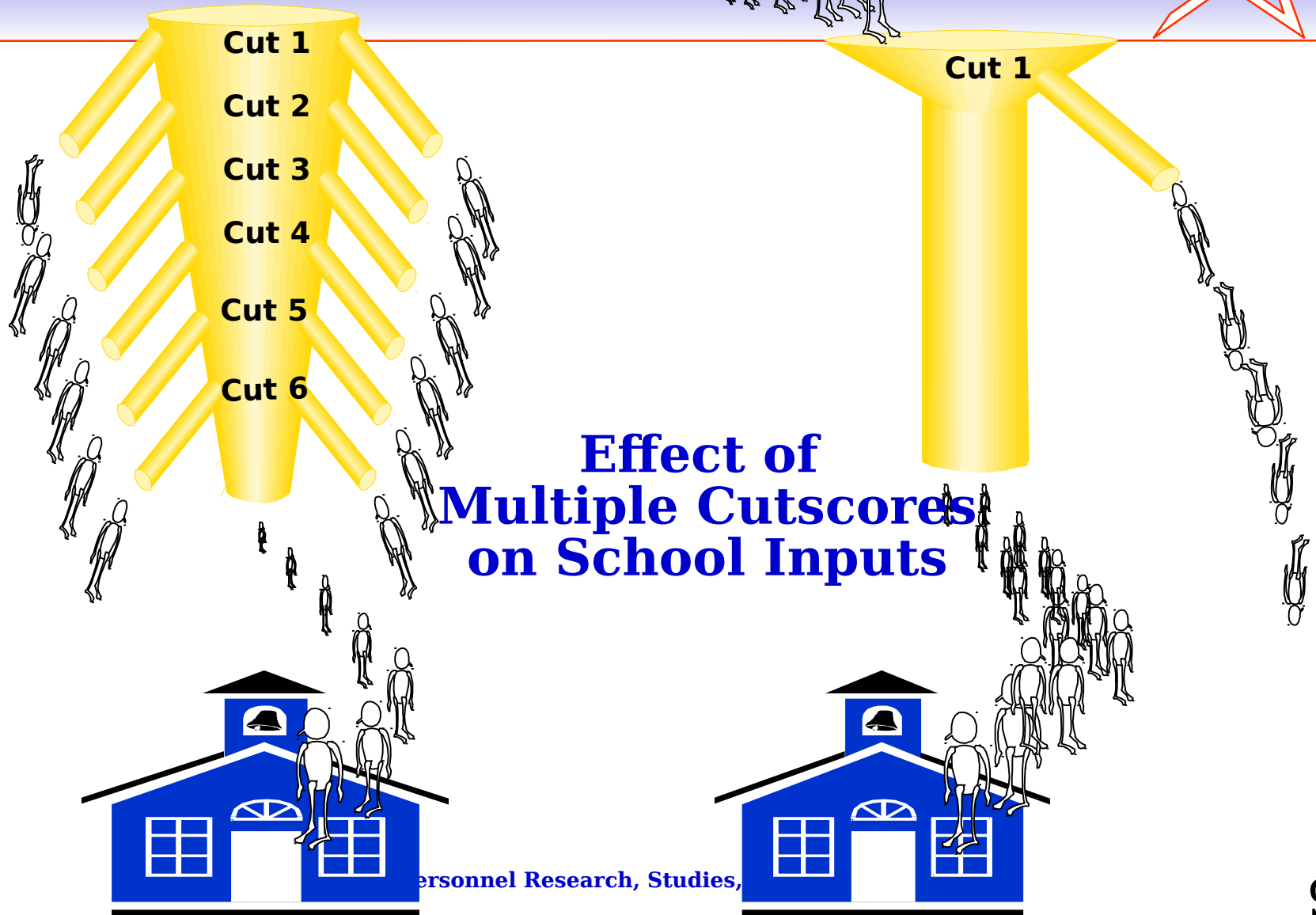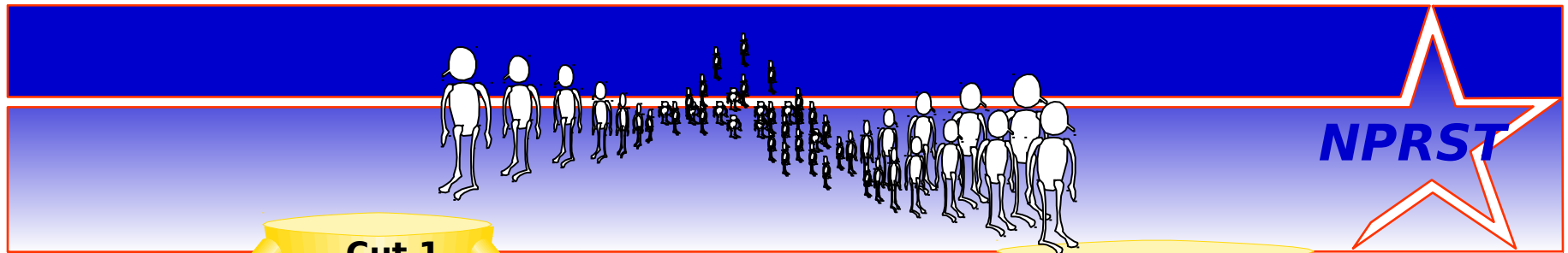
- **VE+AR+NO+CS = 202**

  NO and CS eliminated from ASVAB starting FY02

- **DLAB = 95 for Moderate Language Difficulty**

- **DLAB = 100 for High Language Difficulty**

Student Score Profile Showing Potential for Disqualification with Multiple Cutscores
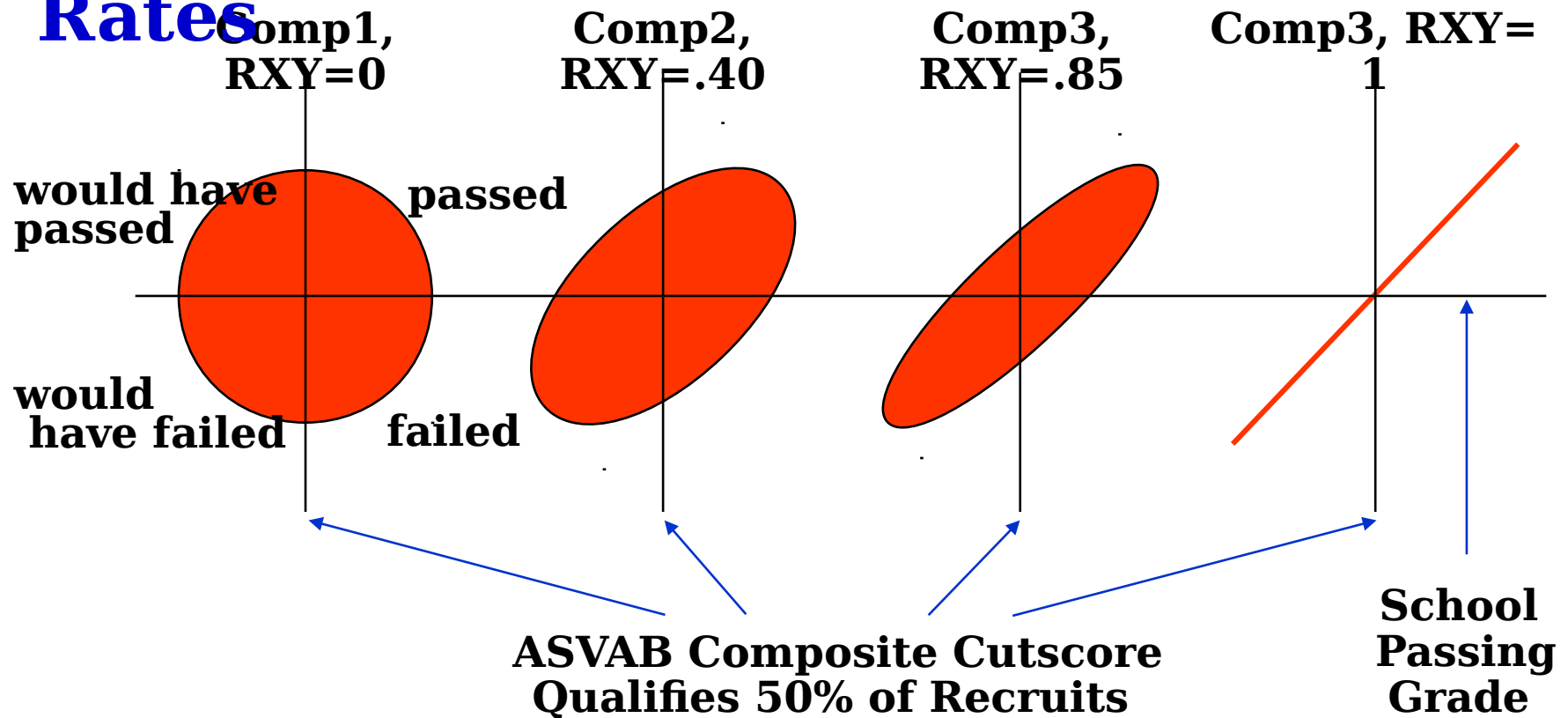
	Cut 1	*Cut 2*	*Cut 3*	*Cut 4*	*Cut 5*	*Cut 6*

VE+AR

AR+MK+EI+GS   True Score

MK+EI+GS

MK+AS

AR+2MK+GS

VE

Ineligible due to measurement error

| 🔵 **Observed Score** — **True Score Probability Range** |

NPRST

Cut 1
Cut 2
Cut 3
Cut 4
Cut 5
Cut 6

Cut 1

Effect of
Multiple Cutscores
on School Inputs

...ersonnel Research, Studies,

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Validity for School Performance

Language/ Difficulty	VE+MK+GS	DLAB	VE+MK+ GS+DLAB	Full Model over ASVAB alone
Spanish (1)	.76	.58	.79	.03
Persian (3)	.17	.30	.23	.06
Russian (3)	.54	.60	.61	.06
Hebrew (3)	.54	.28	.46	-.08
Korean (4)	.73	.59	.74	.01
Arabic (4)	.63	.49	.65	.02
Chinese				

Effects of Validity and Cutscores on Attrition and Qualification Rates

- **Replace VE+AR+NO+CS with VE+MK+GS using the same effective cutscore**

  will improve graduation and setback rates

- **Adopt a the full compensatory model of VE+MK+GS +DLAB with an appropriate DLAB minimum score**

- **Develop a website version of DLAB predictor to better inform applicants of the nature of a language test**

  Site at Navy.com – developed through CNRC

  Provides additional potential CTIs who become informed, interested, and motivated to do well on the DLAB
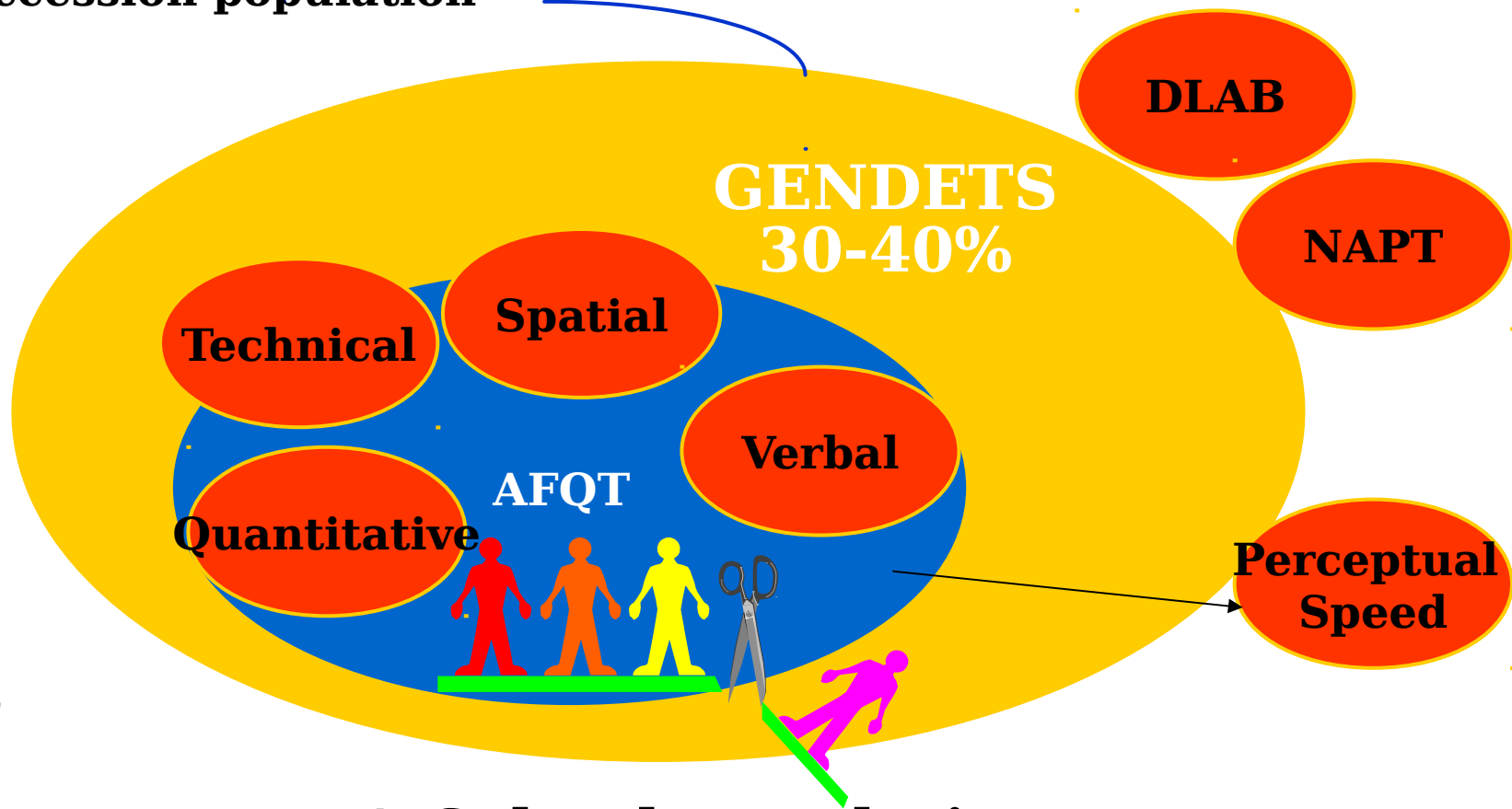
Classification Simulation Work

- *Premise: If the test lowers the average test intercorrelation of a classification battery, differential assignment is enhanced and more job assignments are possible*

- **Evaluation of AO and CS contributions to classification**

  Methods apply to DLAB

Accession population

DLAB

NAPT

GENDETS 30-40%

Spatial

Technical

Verbal

AFQT

Quantitative

Perceptual Speed

*Classification using aptitude areas increases recruit qualification rates over that obtained using only general

A-School population

Classification Simulation Results with Navy RIDE

- **Initial and augmented composite sets**

  About 1/3 of jobs were assigned an AO or CS composite in the augmented composite set condition

- **Results: 400 additional recruits were assigned to jobs out of 38,000 recruits applying the augmented composite set**

  with higher expected school performance in the aggregate

- **Model supports use of DLAB with ASVAB combined, but not yet tested for classification outcomes**

Other Classification Efficiency Models

- **Classification/Cost Effectiveness Model – Paul Hogan**

  Trade-off recruiting, advertising, and compensation costs with training and attrition costs when adding new performance predictors

- **Belgium Optimization model – Francois Lescreve**

  Development of sequential model to approach batch optimization of performance outcomes